Costings Models for Aboriginal and Torres Strait Islander Health Services

Econtech Pty Ltd

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ISBN 0 642 82497 5

Publications Approval Number: 3488/JN8645

In 2003, a series of papers was commissioned to provide information, analysis and advice to Government as part of a Review of the Australian Government's Aboriginal and Torres Strait Islander Primary Health Care Program. The Review examined issues relating to funding for comprehensive primary health care for Aboriginal and Torres Strait Islander people and the impact of activity in this area. The commissioned material complemented information obtained from previous reviews and evaluations as well as that obtained from program data.

An Interdepartmental Committee (IDC) oversaw the Review process. Members of the IDC were from the Australian Government Departments of the Treasury; Prime Minister and Cabinet; Finance and Administration; Immigration and Multicultural and Indigenous Affairs; Health and Ageing (Chair); and Aboriginal and Torres Strait Islander Services.

This is Volume 3 of the published Review papers.

The papers in this series are:

Volume 1. National Strategies for Improving Indigenous Health and Health Care by Judith Dwyer, Kate Silburn and Gai Wilson, La Trobe University.

Volume 2. Investment Analysis of the Aboriginal and Torres Strait Islander Primary Health Care Program in the Northern Territory by Carol Beaver, Centre for Chronic Disease, University of Queensland and Yuejen Zhao, Health Gains Planning Unit, Department of Health and Community Services, Northern Territory.

Volume 3. Costings Models for Aboriginal and Torres Strait Islander Health Services by Econtech Pty Ltd.

Volume 4. Capacity Development in Aboriginal and Torres Strait Islander Health Service Delivery – Case Studies by Cindy Shannon and Helen Longbottom, School of Population Health, University of Queensland.

Volume 5. Cancer, Health Services & Indigenous Australians by John Condon, Cooperative Research Centre for Aboriginal and Tropical Health.

Volume 6. Maternal and Child Health Care Services: Actions in the Primary Health Care Setting to Improve the Health of Aboriginal and Torres Strait Islander Women of Childbearing Age, Infants and Young Children by Sandra Eades, Menzies School of Health Research.

Volume 7. Substance Misuse and Primary Health Care among Indigenous Australians by Dennis Gray, National Drug Research Institute, Curtin University of Technology; Sherry Saggers, Centre for Social Research, Edith Cowan University; David Atkinson, Rural Clinical School, University of Western Australia and Phillipa Strempel, National Drug Research Institute, Curtin University of Technology.

The opinions expressed in these papers are those of the authors and are not necessarily those of the Australian Government.

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Author disclaimer

Econtech was commissioned by the Australian Government Department of Health and Ageing on behalf of the Aboriginal and Torres Strait Islander Primary Health Care Review to prepare a report detailing costings models for providing primary health care services for Aboriginal and Torres Strait Islander Australians. This report sets out Econtech's findings. Econtech makes no representations to, and accepts no liability for, reliance on this work by any person or organisation other than the Australian Government Department of Health and Ageing. Any person, other than the Australian Government Department of Health and Ageing, who uses this work does so at their own risk and agrees to indemnify Econtech for any loss or damage arising from such use.

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Abbreviations

ABS	Australian Bureau of Statistics
AIHW	Australian Institute of Health and Welfare
ARIA	Accessibility/Remoteness Index of Australia
ASGC	Australian Standard Geographical Classification
ATSIC	Aboriginal and Torres Strait Islander Commission
CGC	Commonwealth Grants Commission
CHINS	Community Housing and Infrastructure Needs Survey
CVD	cardiovascular disease
DALY	disability adjusted life year
ERP	estimated resident population
Department	Australian Government Department of Health and Ageing
GISCA	National Key Centre for Social Applications of Geographical Information Systems
GP	general practitioner
HMD	hospital morbidity data
MBS	Medical Benefits Scheme
NHPA	National Health Priority Area
NHS	National Health Survey
OATSIH	Office for Aboriginal and Torres Strait Islander Health
OP9	Occasional Paper 9: *Insights into the utilisation of health services in Australia based on linked administrative data*
PBS	Pharmaceutical Benefits Scheme
PHC	Primary Health Care
RRMA	Rural, Remote and Metropolitan Area
SAR	service activity reporting
SLA	statistical local area

Summary

Indigenous Australians have lower utilisation rates of mainstream health services compared to the general population despite having poorer health status. For example, Medical Benefits Scheme (MBS) and Pharmaceutical Benefits Scheme (PBS) spending for Indigenous people was only $224 per capita compared to $601 per capita for non-Indigenous people in 1998– 99.[i] In response, Indigenous-specific health services have been introduced but these services are not universally available to Indigenous Australians. This means that there is a dual health system in operation for Indigenous people — the mainstream health program and Indigenous-specific health programs.

The purpose of this report is to answer the following questions based on the dual nature of health services for Indigenous people:

1. What would have to be spent on primary health services for Indigenous Australians (not distinguishing between general and Indigenous-specific health services) to provide per capita expenditure relative to non-Indigenous Australians that reflected relative morbidities? This is a relative needs or population benchmark approach.
2. What would have to be spent on Indigenous-specific primary health services for Indigenous Australians to provide them with universal access to Indigenous-specific programs? This is a supply side or resource requirements approach.

This study is therefore concerned with estimating the costs of two approaches to Indigenous health funding. For an overall assessment of these two approaches, their benefits would also need to be examined and compared with our estimates of the costs. We understand that these benefits are being assessed elsewhere in the Review.

Estimating the relative health needs of Indigenous Australians

In answering Question 1, Econtech estimated that, on a relative needs basis, per capita spending on health services would have to be about 2.2 times higher for Indigenous Australians than for non-Indigenous Australians ($5575 versus $2518) (see Table 1). By inference, the 2.2 factor would also apply to primary health care, and given that primary health care spending is around 45% of total spending, the per capita figure corresponding to overall spending of $5575 would be $2508.

Since most Indigenous Australians need some health care in a twelve-month period and given the much greater burden of disease and injury to which they are subject, these calculations should more properly apply to the figures for users in Table 1. The same logic would then yield estimated current per capita primary health care spending 'need' of around $5100.

Table 1: Actual and needs-based estimates of per capita health spending, Indigenous and non-Indigenous Australians, 1998–99

Sub-population	Per capita health spending (actual)	Per capita health spending (relative need)
Indigenous(incl non-use)[(a)]	$3065	$5575
non-Indigenous(incl non-use)[(a)]	$2518	$2518
Indigenous(users)[(b)]	$3689	$10 187
non-Indigenous(users)[(b)]	$3031	$3031

Notes:

(a) In any 12-month period many Australians make no demand on the health system (approximately 17%). This has the effect of lowering per capita spending compared with the corresponding figures for users of the system (reported separately in this table).

(b) Per capita estimates for those who actually use Australia's health system in a 12-month period.

Source: Analysis reported in this paper and ABS & AIHW 2003.

The same table shows that, in reality, despite the much poorer health status of the Indigenous population, actual health spending per Indigenous person is only 1.2 times the per capita health spending for the general population ($3065 versus $2518). The explanation for this difference is that Indigenous people tend to have lower utilisation rates of mainstream health services, exacerbated by access difficulties to mainstream services due to the dispersed nature of the Indigenous population.

Estimating resource requirements

The health circumstances of Indigenous Australians vary significantly between urban, rural and remote settings, and, indeed, within each of these broad settings. Physical access to health services, for example, is much more difficult outside metropolitan areas, and can vary greatly in rural and remote areas, depending on government choices about where to locate facilities such as hospitals and community health centres.

Assessments of relative need are clearly useful in deciding how scarce resources might be best targeted on a needs basis. However, their deficiencies and the caveats that necessarily attach to them mean that they cannot substitute for judgments informed by wider considerations of the issues (e.g. evidence on what works for whom and under what circumstances).

The availability and quality of data on the health of Indigenous Australians also usually dictate that analyses of relative health needs have to be conducted on an Australia-wide basis. They therefore do not take into account circumstances that may be peculiar to the health and well-being of individual communities or those living in a particular geographic area. Nevertheless, the evidence that is available indicates that the Indigenous people living in remote areas of Australia (i.e. those farthest from the kinds of services most Australians who live in metropolitan areas can easily access) have the highest relative disadvantage. Health services specific to Indigenous people have been introduced to provide health services in some areas, particularly where the mainstream health service cannot be easily accessed. These health services are documented in a number of case studies (see notes to Table 2). The case studies were checked in terms of their representativeness by examining comparative utilisation rates. One on-site familiarisation visit was also made by a representative from Econtech.

Preliminary results of generalising from the case studies to the Indigenous population as a whole suggest that the total cost of an Indigenous-specific universal primary health care system, on top of Medicare, is in the order of $409 million (or approximately $890 per Indigenous person). This is lower than that estimated on a relative needs basis of $2500 per capita (minimum), but this latter figure includes Medicare.

Table 2: Costs of a universal Indigenous-specific primary health care system

	Very Remote	Remote	Rural	Urban	Overall
Full service in remote areas and partial service in rural and urban areas[a]:					
Total cost of professional health staff ($m)	87	24	34	43	188
Total Staff Costs($m)	129	35	46	58	268
Total Costs($m)	196	53	76	84	409
Costs per capita($)	2789	1266	561	399	893
Full service in all areas[b]:					
Total costs ($m)	196	53	151	169	570
Cost per capita ($)	2789	1266	1125	800	1244

Note:

(a) The estimates of full service in remote areas and partial service in rural and urban areas are based on case studies.

(b) No case studies are available for a complete service in rural and urban areas, so estimates of full service in all areas are only indicative of the possible cost of a complete service in rural and urban areas.

Source: Econtech

More money is required to deliver Indigenous-specific health services in very remote areas compared to rural and urban areas (see Table 2). The cost per Indigenous person in very remote areas, for example, is estimated at $2789, while the corresponding figure in urban areas is $399 per capita for a referral service and perhaps $800 per capita for a full service.

The appropriateness of the staffing level and mix from the case studies were examined, which resulted in costing an increase in the number of specialists in very remote, remote and rural areas. This resulted in a rise in costs from $409 million (base) to $432 million — translating into an increase from $893 to $944 on a per capita basis.

The costs would also increase significantly if a more complete service for Indigenous people in rural and urban areas were costed rather than a partial service in rural areas and referral service in urban areas. Case studies are not available for a complete service in rural and urban areas, so this report is only able to provide very broad estimates. These broad estimates suggest that a comprehensive service in rural and urban areas may cause the costs to increase significantly, from $409 million to $570 million — equivalent to a rise from $893 to $1244 on a per capita basis (Table 2). The increase in costs would be considerable because large numbers of Indigenous Australians live in Australian rural and urban areas.

1 Introduction

This report forms part of the Aboriginal and Torres Strait Islander Primary Health Care Review and was commissioned on behalf of the Review by the Australian Government Department of Health and Ageing (the Department). The purpose of the Primary Health Care Review is to provide advice to the Australian Government, in the context of the 2004–05 budget process, on the impact of current investment in primary health care for Indigenous Australians, as well as to provide advice on future requirements and their likely impacts. As part of the review, Econtech has been commissioned by the Department to develop models to cost the necessary resources for the delivery of appropriate primary health care to Aboriginal and Torres Strait Islander peoples.

Estimated Australian Government spending on mainstream primary health care services for Indigenous people and the general population are roughly the same (per capita Indigenous spending slightly exceeds that for the general population). This is despite the much poorer health status of Indigenous Australians compared to other Australians—indicating that the current level of health funding is not meeting the health needs of Indigenous Australians. This is because Indigenous people tend to use the mainstream health service less than the general population. One reason for this is that, due to the dispersed nature of the population, Indigenous people have more difficulty in accessing mainstream health services compared to the general population. In response, Indigenous-specific health services have been introduced but these services are not universally available to Indigenous Australians. This means that that there are two kinds of health services in operation for some Indigenous people: mainstream health services (Medicare) and Indigenous-specific health programs.

While all care, skill and consideration has been used in the preparation of this report, the findings are based upon the terms of reference of the Department of Health and Ageing and are designed to be used only for the specific purpose set out below. If you believe that your terms of reference are different from those set out below, or you wish to use this work or information contained within it for another purpose, please contact Econtech.

The purpose of this report is to answer the following questions based on the dual nature of health services for Indigenous people.

1. Based on relative health need, what would have to be spent on primary health care services for Indigenous Australians (not distinguishing between general and Indigenous-specific health services) to provide commensurate health care to that enjoyed by non-Indigenous Australians? This is a relative needs or population benchmark approach.
2. What would have to be spent on Indigenous-specific primary health services for Indigenous Australians to provide them with universal access to Indigenous-specific programs? This is a supply side or resource requirements approach.

This study is therefore concerned with estimating the costs of two approaches to Indigenous health funding. For an overall assessment of these two approaches, their benefits would also need to be examined and compared with estimates of the costs. We understand that these benefits are being assessed elsewhere in the review.

A population benchmark costings model is developed to answer Question 1. This model costs the amount of health resources required if the mainstream health system works for Indigenous Australians in the same way as it does for non-Indigenous Australians. This costings model has as its focus the different burden of disease in the Indigenous versus the non-Indigenous population and the implications of this for health care spending in general, and primary health care spending in particular.

A resource requirement costings model is developed to answer Question 2. It is developed in greater depth than the population benchmark model and estimates the costs of resourcing primary health care services that are specific to Indigenous Australians. It is based on Indigenous-specific health care services, which are targeted to the needs of Indigenous Australians. This model takes into account geographic location by estimating resource requirement models for urban, rural and remote areas separately.

This report is structured as follows:

- Chapter 2 presents the results from the population benchmark costings model.
- Chapter 3 examines current spending on Indigenous health.
- Chapter 4 develops the resource requirement costings models.
- Chapter 5 outlines some key policy context surrounding the analysis.

Disclaimer

The purpose of this report is to answer the following questions based on the dual nature of health services for Indigenous people.

1. Based on relative health need, what would have to be spent on primary health services for Indigenous Australians (not distinguishing between general and Indigenous-specific health services) to provide commensurate health care to that enjoyed by non-Indigenous Australians (relative needs or population benchmark approach)?
2. What would have to be spent on Indigenous-specific primary health services for Indigenous Australians to provide them with universal access to Indigenous-specific programs (supply side or resource requirements approach)?

   The findings in this report are subject to unavoidable statistical variation. While all care has been taken to ensure that the statistical variation is kept to a minimum, care should be used whenever using this information. Should you require clarification of any material, please contact Econtech.

2 Population benchmark costings model

The population benchmark costings model is developed to answer Question 1, outlined in previous chapter. In this model, the relative health needs of the Indigenous and general population are taken into account by comparing the health status of Indigenous people with that of the overall population[a]. This model is based on the assumption that Australia's health system (basically Medicare) is as capable of meeting the health needs of Indigenous Australians as it is of meeting the needs of non-Indigenous Australians.

This part of the report also goes on to consider some of the implications of such an assessment in terms of resource requirements to meet the health needs of Indigenous people. In particular, the problem of access to appropriate primary and secondary health services in rural and remote areas of Australia (where many Aboriginal and Torres Strait Islander peoples live) is considered.[ii] [b](see Chapters 3 and 4).

2.1 Availability of data

A general lack of readily available and reliable data on the health of Aboriginal and Torres Strait Islander peoples means that meaningful quantitative comparisons of patterns of relative health need are not available. As a result, researchers and commentators with an interest in Indigenous health and welfare constantly request relevant agencies to improve the collection and availability of data on Indigenous Australians both to inform decision making and to provide evidence for monitoring achievements and evaluating government programs and other initiatives. Typical of these exhortations is the Commonwealth Grants Commission's (CGC) complaint that

> *…there are practically no data on what mainstream funds are spent in each region of each State, or on any specific group of people in any State.*[iii]

Even obtaining such basic information as the size and composition of Aboriginal and Torres Strait Islander peoples is not without its problems. An example is the uncertainties of interpreting Indigenous population counts from the Australian Bureau of Statistics (ABS) Census of Population and Housing, where an increasing tendency towards self-identification over time suggests that Indigenous Australians are the most rapidly growing component of the overall population (recording, for example, a 16% increase between the 1996 and 2001 Censuses). This makes the monitoring of rates of incidence of health conditions problematic.[iv] [c]

The dearth of data and its occasional poor quality challenge researchers to make the most of the information that is available, including that contained in:

- *The Health and Welfare of Australia's Aboriginal and Torres Strait Islander peoples*,[v] the Community Housing and Infrastructure Needs Survey (CHINS 2001),[vi] [d] and periodic National Health Surveys (NHSs);[vii]
- advance copy of *Burden of disease and injury of Aboriginal and Non-Aboriginal Population in the Northern Territory;*[viii]

a Bearing in mind that Indigenous Australians comprise only a tiny fraction of the total (2.4% according to the 2001 Census of Population and Housing).

b For example, the Indigenous proportion of the overall population living in very remote areas of Australia is 45%.

c For example, ABS & AIHW calculates rates reported in *The Health and Welfare of Australia's Aboriginal and Torres Strait Islander peoples* based on the low series of its experimental projections based on the 1996 Census, published for the years 1996–2006.

d The most recent survey was conducted in 2001.

- occasional papers published by the Department of Health and Aged Care (e.g. *Hospital casemix data and the health of Aboriginal and Torres Strait Islander peoples,*[ix] *Insights into the utilisation of health services in Australia based on linked administrative data*[x] *and Health services in the city and the bush: measures of access and use derived from linked administrative data*[xi]); and
- the CGC Report on Indigenous funding.[xii]

2.2 Approach

Analysing patterns of expenditure on health services provides insights into:

- the way Australians use their health system;
- the services that are delivered in various settings (e.g. visits to general practitioners and specialists, attendance at community health centres or acute care being delivered in hospitals); and
- where services are delivered (e.g. in cities or in rural and remote areas of Australia).[e]

As an added dimension, use patterns can be studied in terms of the overall population or some part of it (e.g. use by Indigenous Australians compared with non-Indigenous use) which is the particular focus of this paper. Its point of departure is data and analysis contained in *Insights into the utilisation of health services in Australia based on linked administrative data* (Occasional Paper 9).[xiii]

The administrative data that were linked in Occasional Paper 9 were the MBS, PBS and hospital morbidity data (HMD) records relating to some 1 466 510 Western Australians who:

- received at least one MBS service between 1 July 1995 and 30 June 1996;
- were dispensed at least one PBS script between 1 January 1995 and 31 December 1995; or
- were admitted to hospital at least once between 1 July 1995 and 30 June 1996.

Representing approximately 83% of the then Western Australian population, this sample of Australian health care users is considered to be representative of the overall population. Similarly, the cost estimates of the public outlays involved can be considered as representative of individual demands on the system at the time.

Linking the Medicare records at the level of the individual produces a rich dataset in which to search for insights into the use of health services by Australians, with the health status of a person inferred from a combination of MBS, PBS and HMD data relating to the individual.[f]

In Occasional Paper 9, the focus was on producing cost estimates relating to individuals suffering from at least one of the National Health Priority Area (NHPA) conditions of cancer, cardiovascular disease (CVD), diabetes, injuries, mental health and asthma (and their comorbidities). In this analysis the focus is on NHPA conditions suffered by Indigenous Australians compared with their non-Indigenous counterparts. The focus of the analysis is therefore on morbidity rather than mortality.[g]

The demands that Indigenous Australians made on the mainstream health system as represented by the extent that they used Medicare are included in the analysis dataset. However, they were not separately

e Examination of such data cannot shed light where these health services are either effective or efficient.

f As described in OP9, the linking exercise was conducted in such a way as to preserve the anonymity of the individuals to which the records related.

g The fact that Indigenous Australians tend to die prematurely compared to non-Indigenous Australians is well documented—with a gap in life expectancies at birth of the order of 20 years.

identified in the data.[h] With estimates of the demands made on Australia's health care system available from Occasional Paper 9 (in terms of the NHPAs), estimates of the prevalence of NHPAs among Indigenous Australians are required to estimate relative need. Fortunately, some such estimates are available.

The advantage of this reported analysis is that the dataset—the starting point in this analysis—tracks individuals as they encounter Australia's health system[i]. It thus takes into account any multiple illnesses and conditions from which many individuals (including Indigenous Australians) suffer. In fact, the particular dataset from which inferences about the health status of Indigenous Australians are made focuses on the NHPAs and their comorbidities which together account for well over half of all health spending.

Another potential advantage of this approach is that if reliable estimates are available or can be estimated of the prevalence of NHPA conditions among Indigenous Australians living in particular geographical areas, relative health needs specific to the particular (sub-) population of interest can be estimated. Such context-specific information would clearly be useful in designing the extent and type of services to be made available in specific localities—services that could then be tailored to local needs and circumstances.

2.3 Analysis and results

Derived from Occasional Paper 9,[xiv] Table 2.1 sets out the estimated prevalence among the overall Australian population (overwhelmingly the non-Indigenous population) of the NHPA conditions. Prevalence in this case is calculated on the basis of identified conditions diagnosed with respect to individuals who had at least one encounter with the health system in the twelve-month analysis period.

In any twelve-month period, many Australians will not make any demands on the health system (estimated at almost 17%, based on the information contained in Occasional Paper 9).[j] Most people (nearly 70%) do not suffer from any of the NHPAs (but visit doctors, take PBS drugs and get admitted to hospital for many other conditions).

Based on information contained in Occasional Paper 9, Chart 2.1 (in Appendix A) graphs the prevalence of the NHPAs and their comorbidities among the general (overwhelmingly non-Indigenous) population. Thus cancer (at just over 3%) is the most commonly occurring NHPA condition, followed by injuries (2.1%), CVD (1.7%), mental health (1.6%), asthma (1.5%) and diabetes (1.2%)—with a combination of cancer and CVD the most common comorbidity (affecting an estimated 0.3% of the population at any one time).

Chart 2.2 (in Appendix A) graphs the estimated per capita costs of treating NHPA conditions relative to the cost of treating other conditions (taken to be unity and costing on average an estimated $493 in 1995–96).[k] Thus the average cost per capita of treating an individual suffering from cancer relative to one suffering some other condition is 5.03 while someone suffering from a combination of the cancer, injuries and mental health NHPA conditions is estimated, on average, to cost government 29.09 times as much as someone suffering some other condition.[l]

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h The single most important initiative to enable reliable, high-quality data on the health status of Indigenous Australians to be produced for analytic purposes would be to add an Indigenous flag to Medicare data. In 2002–03, the Australian Government introduced a voluntary option for Indigenous people to identify that they are Aboriginal or Torres Strait Islander people when enrolling in Medicare, or amending their enrolment details. (ABS & AIHW 2003, p.11).

i This is in contrast to statistics compiled by authorities such as the ABS and AIHW which generally refer to single aspects or dimensions of health and therefore cannot take into account the multiple illnesses and conditions which many Indigenous Australians experience.

j This does not imply that the proportion of Australians who do not visit a doctor, consume any PBS drugs, nor get admitted to hospital in any twelve-month period are healthy—some non-users during any period may still suffer from one or more NHPA conditions, and many will suffer from other conditions.

k The purpose of moving from an absolute (as in Occasional Paper 9) to a relative costing basis is to apply the relativities apparent in Occasional Paper 9 (which are assumed to continue to apply) to more up-to-date estimates of per capita and aggregate health spending now available (e.g. from the AIHW).

l This combination of NHPA conditions is estimated to be the most expensive to treat over a twelve-month period (virtually the same as someone suffering simultaneously from five NHPA conditions).

Table 2.1: Prevalence of National Health Priority Area (NHPA) conditions (and their comorbidities) in the general population

Condition	Population prevalence (%)
Cancer	3.0304
Injuries	2.0698
Cardiovascular	1.7362
Mental health	1.5744
Asthma	1.4513
Diabetes	1.1551
Cancer & cardiovascular	0.2581
Cardiovascular & diabetes	0.2073
Cancer & mental health	0.2003
Cardiovascular & mental health	0.1691
Injuries & mental health	0.1630
Cancer & injuries	0.1607
Cancer & diabetes	0.1413
Cardiovascular & injuries	0.1085
Asthma & cardiovascular	0.1067
Diabetes & mental health	0.0870
Asthma & mental health	0.0842
Asthma & cancer	0.0649
Diabetes & injuries	0.0614
Asthma & injuries	0.0368
Cancer & cardiovascular & mental health	0.0356
Cancer & cardiovascular & diabetes	0.0327
Cardiovascular & diabetes & mental health	0.0326
Asthma & diabetes	0.0324
Asthma & cardiovascular & mental health	0.0243
Cancer & diabetes & mental health	0.0223
Asthma & cancer & cardiovascular	0.0194
Cancer & cardiovascular & injuries	0.0185
Cancer & injuries & mental health	0.0165
Asthma & cancer & mental health	0.0158
Cardiovascular & injuries & mental health	0.0154
Asthma & cardiovascular & diabetes	0.0141
Cardiovascular & diabetes & injuries	0.0135

Asthma & injuries & mental health	0.0099
Asthma & diabetes & mental health	0.0083
Diabetes & injuries & mental health	0.0074
Cancer & diabetes & injuries	0.0067
Asthma & cancer & diabetes	0.0066
Asthma & cancer & injuries	0.0040
Asthma & cardiovascular & injuries	0.0040
Asthma & diabetes & injuries	0.0019
4 conditions	0.0398
5 conditions	0.0029
Other conditions	69.8253
No recorded use of health care system (12 month period)	16.9237
Total	**100**

Source: Derived from Department Health and Aged Care 2000.

Based on information reported in the data sources identified in Section 2.1, including expert opinion reflected in *Burden of disease and injury of Aboriginal and Non-Aboriginal Population in the Northern Territory*,[m] Charts 2.3 and 2.4 (Appendix A) present the estimated prevalence of the NHPAs (Chart 2.3) and their comorbidities (Chart 2.4) among Indigenous Australians (and presents corresponding estimates for non-Indigenous Australians for comparative purposes).[n]

Finally, Table 2.2 (below) presents estimates of per capita health spending on Indigenous Australians (need-based) and non-Indigenous Australians (actual) where the implicit assumption is that the health needs of non-Indigenous Australians are basically being met.

Estimates in Table 2.2 are in respect of all public subsidies for the consumption of health services (i.e. they include government outlays for consultations with general practitioners (GPs) and specialists and admissions to public and private hospitals). Further, because they are derived from data for Western Australia, the estimates include a fair representation of services provided in urban, rural and remote settings. Thus the per capita figures reported in Table 2.2 take into account the fact that some health care services are more expensive to provide than others (e.g. comprehensive primary health care services in remote parts of Australia compared with the cost of the same services provided in the capital cities). Both Occasional Paper 9 and this report include estimates of the cost to provide services in remote as well as rural and urban Western Australia in 1996.

The figures do not (and cannot) take into account the fact that some services are either simply not available or, if provided, are not used and therefore are not counted among actual outlays. Thus they do not feed into calculations of relative need based on population models of use of the kind analysed here.

m For example, the authors of this report conclude that the Aboriginal population of the Northern Territory experience 2.5 times the burden of disease observed in the non-Aboriginal population at all ages, with as much as 4.1 times higher disability adjusted life year (DALY) rates in the 35 to 54 age group—with the leading causes of disease burden being cardiovascular disease and mental disorders.

n The estimates of the prevalence of NHPA conditions among Indigenous Australians presented in Chart 2.3 is taken from the literature cited (mainly AIHW and ABS data); the prevalence of comorbidities involving NHPA conditions presented in Chart 2.4 is based on the patterns of such multiple occurrence of disease amongst the general population (as estimated in OP9)—but with the different prevalence of single NHPA conditions (among Indigenous Australians) serving as a different point of departure. Thus, for example, because the prevalence of diabetes is high among Indigenous relative to non-Indigenous Australians, so commensurately are its estimated comorbidities with other NHPA conditions among Indigenous Australians compared with their non-Indigenous counterparts.

Table 2.2: Actual and needs-based estimates of per capita health spending, Indigenous and non-Indigenous Australians, 1998–99

Sub-population	Per capita health spending (actual) ($)	Per capita health spending (relative need) ($)
Indigenous (incl non-use)[a]	3 065	5 575
Non-Indigenous (incl non-use)[a]	2 518	2 518
Indigenous (users)[b]	3 689	10 187
Non-Indigenous (users)[b]	3 031	3 031

Notes:

(a) In any twelve-month period there are many Australians who make no demand on the health system (of the order of 17%). This has the effect of lowering per capita spending compared with the corresponding figures for users of the system (reported separately in this table).

(b) Per capita estimates for those who actually use Australia's health system in a twelve-month period.

Source: Analysis reported in this paper and ABS & AIHW 2003.

Based on the analysis contained in this paper it is estimated that, given that some $2518 per capita was estimated by the Australian Institute of Health and Welfare (AIHW) to have been devoted to meeting the health needs of non-Indigenous Australians in 1998–99, meeting the health needs of Indigenous Australians is estimated to cost $5575 (or some 2.21 times as much as non-Indigenous Australians) based on estimated relative health need. While the 2.21 estimate logically applies to overall publicly sourced health spending based on the average relative health needs of Indigenous Australians compared to their non-Indigenous counterparts, there is no reason to suppose that a particular area of spending would greatly depart from this average. Thus the 2.21 multiple could arguably serve as a rule of thumb across the various sectors including primary health care. Such a rule of thumb represents an average figure that will mask variation in individual circumstances.

Applying the $5575 figure to the census-based estimate of 458 284 Indigenous Australians (Table 4.2) yields an estimated overall figure of approximately $2.55 billion. This compares with an estimated public health bill of some $47.34 billion[o]. Using the 45% figure as the proportion of the health dollar that is spent on primary health care (see below) the above figures would suggest that the population-based, relative health need required by publicly financed primary health care to be spent on Indigenous Australians should be around $1.15 billion. This compares to $21.3 billion for non-Indigenous Australians.

Primary health care accounts for around 45% of the health care dollar so that the $5575 representative estimate of per capita Indigenous health need would translate into a demand for per capita primary health care spending of some $2500 (and arguably around $2800 in current prices given that these are 1998–99 figures). Further, since few Indigenous Australians would not need any health care in a twelve-month period given that they carry a much greater burden of disease and injury, these calculations should more properly apply to the figures for users in Table 2.2. Applying the same logic as above would then yield estimated current per capita primary health care spending 'need' of around $5100. Even this modified estimate is still an average figure that masks great variability in individual circumstances. Based on expert opinion, for example,

o Equal to the estimated per capita needs-based figure of $2518 (Table 2.2) times the estimated non-Indigenous population of 18.8 million people (Table 4.2).

the burden of disease can be much higher among Indigenous Australians living in remote parts of Australia compared even with their Indigenous counterparts in urban Australia. Thus the average figure of $5100 could well mask relative health need ranging in a typical year from near zero to tens of thousands of dollars.

Finally, it could be argued that even the $5100 figure represents an underestimate to the extent that the health service usage figures underlying Table 2.2 contained too few primary health care services located in rural and remote areas of Western Australia in relation to the need for such services. The relative costs of providing primary health care services in various regions is taken up in Chapter 4.

2.4 Comparisons with other assessments

A range of studies and approaches from the literature provides estimates of the resource requirements for Indigenous health which are quite variable, ranging from 1.9 to 7.3 times the average resources required by the general population.[xv] There are comparability problems, however, as some of the studies only take into account the cost of services based on health (but not the higher costs in remote areas), while others only apply to health service requirements for Indigenous Australians in remote areas. Further, studies yielding estimates at the higher end of the range include the cost of providing additional services to provide culturally appropriate programs and initiatives to address health inequities.

According to AIHW (2001), estimates of per capita expenditure on health services for Aboriginal and Torres Strait Islander peoples was $3065 in 1998–99, or some 22% higher than the corresponding estimate for non-Indigenous persons.[xvi]

On the basis of analysis presented in this chapter, the $3065 figure is estimated to be approximately $5575, or some 2.2 times the corresponding non-Indigenous figure ($2518). Both these figures are diluted by significant non-use of the health system by many Australians in any twelve-month period: if the focus is on users of the system the $5575 figure rises to $10 187 per capita per annum (with the corresponding figure for non-Indigenous users at $3031).

The ratio of per capita health spending on Indigenous to non-Indigenous Australians varies by type of service[xvii] (see Table 2.3) which although reporting government spending only encompass all such spending (e.g. GP visits, specialist consultations and hospital stays).

Table 2.3: Relative health spending, actual versus indicative relative need, various settings

Setting	Ratio (Indigenous to non-Indigenous)
Actual relative need	
-Overall[(a)]	1.22
-Community health centres[(a)]	5.10
-Public hospitals (acute care)[(a)]	2.00
-PBS[(a)]	0.30
-Medicare[(a)]	0.40
Estimated relative need	
Overall[(b)]	2.21

(a) ABS & AIHW 2003

(b) Source is analysis presented in this paper

3 Analysis of current spending patterns

This chapter outlines the regional differences in health needs of Indigenous people and in health expenditure on Indigenous-specific health programs. Accessibility issues are also described in this section. As such, it serves as a backdrop to Section 4, which estimates the costs of providing access to Indigenous-specific programs to all Indigenous Australians.

The availability and quality of data on the health of Indigenous Australians usually dictate that analyses of relative health need must be conducted at a national level. They therefore miss circumstances that may be peculiar to the health and wellbeing of individual communities or those living in a particular geographic area. Nevertheless, the evidence that is available seems to point to highest relative disadvantage being experienced by Aboriginal and Torres Strait Islander peoples living in remote areas of Australia (i.e. those farthest from the kinds of services most Australians who live in metropolitan areas can easily access). For example, one of the main findings of the CGC *Report on Indigenous Funding* was that:

> *The indicators we measured consistently point to the highest needs per person (or per household) being in the remote ATSIC regions.*[xviii]

Chart 3.1 in Appendix B is based on information contained in the CGC report and shows the greater the distance Indigenous Australians live from services—as proxied by Accessibility/Remoteness Index of Australia (ARIA) values[p] the higher their mortality rates. In this case the indicator measure was age-standardised death rates for Indigenous Australians transformed to ratio form (where a ratio above 1 indicates a greater-than-average death rate, while one below 1 indicates a lower-than-average rate).

Chart 3.2 in Appendix B (again based on information contained in the CGC report) also indicates that when the indicator measure is illness, rather than death—with illness proxied by the rate of hospital separations[q] and access to services proxied in this case by Rural, Remote and Metropolitan Area (RRMA) values[r]—the greater the distance Indigenous Australians live from services, the higher are their morbidity rates.

3.1 Accessibility issues

Access to services and the type of services on offer within reach of where people live affect use of those services. Being 'within reach' in the bush of whatever local services are available means having access to transport.

Analysis of accessibility issues has been greatly aided by the development of ARIA (see box below), based on road distances to service centres of various sizes. As a result of the development of ARIA, the ABS has added a remoteness measure to its Australian Standard Geographical Classification (ASCG), so that any area of Australia can be classified in terms of its remoteness into one of five categories:

- major cities;
- inner regional;
- outer regional;
- remote; and
- very remote.[s]

p Based on the Accessibility/Remoteness Index of Australia (ARIA) developed by the National Key Centre for Social Applications of Geographical Information Systems at the University of Adelaide. This classification of localities measures accessibility and remoteness in terms of a location's road distance from service centres with populations of 5000 or more. Each location in Australia is classified into one of five categories: highly accessible; accessible; moderately accessible; remote; or very remote.

q Hospital separations are records of the times when people 'separate' from (i.e. leave) hospital, to either go home, be transferred to another hospital or because they have died.

r The RRMA classification and ARIA seek to classify locations on the basis of remoteness. The RRMA classification preceded ARIA and sought to classify locations on the basis of population size and distance from nearby centres. A version of ARIA (ARIA Plus) has now been officially adopted by the ABS in its Australian Standard Geographical Classification (ASGC).

s This reworking and renaming of ARIA categories by the ABS is, arguably, unfortunate in its big-city-centric aspects since, for example, places such as Darwin are labelled 'outer regional'.

According to this geographic classification, for example, 25% of Indigenous Australians live in remote or very remote areas (compared with only 2% for non-Indigenous Australians). In addition, the Indigenous proportion of the total population rises with increasing geographic remoteness—from 1% of the total population living in major cities to 45% in very remote areas[xix].

ARIA

Dissatisfied with existing area classifications—including its own previous efforts in the form of the Rural, Remote & Metropolitan Areas (RRMA) classification and the ABS classification of its Australian Standard Geographical Classification (ASCG)—the then Department of Health and Aged Care commissioned the National Key Centre for Social Applications of Geographical Information Systems (GISCA) in 1999 to develop an objective measure of accessibility to services that could also be used as an unambiguous geographic approach to defining remoteness (and thus the basis for a new areal classification which would provide the basis for a shared meaning for rural and remote Australia).

The impetus to develop a new remoteness classification came from a widely felt need to tailor services to meet the needs of Australians living in regional Australia based on an agreed measure of their (lack of) accessibility to services regarded as normal for the majority of Australians living in metropolitan areas. Desirable attributes of such a measure included that it be comprehensive, sufficiently detailed, as simple as possible, transparent, defensible, and stable over time as well as making sense 'on the ground'.[xx]

The result was ARIA—the Accessibility/Remoteness Index of Australia. The original ARIA calculated remoteness as accessibility to some 201 serviced centres based on road distances. Remoteness values for some 11 340 populated localities were then derived from the road distance to service centres in four size categories and remoteness values for each populated locality interpolated to a 1 km grid covering the whole of Australia and averages calculated for larger areas. To create an associated areal classification, ARIA values were grouped into five categories using 'natural breaks' in what was a continuous variable ranging (as a result of the weighting system used) from 0 (least remote) to 12 (most remote). The categories were:

- highly accessible (ARIA score 0–1.84)—relatively unrestricted accessibility to a wide range of goods and services and opportunities for social interaction;
- accessible (ARIA score 1.84–3.51)—some restrictions to accessibility to some goods, services and opportunities for social interaction;
- moderately accessible (ARIA score 3.51–5.80)—significantly restricted accessibility of goods, services and opportunities for social interaction;
- remote (ARIA score 5.80–9.08)—very restricted accessibility of goods, services and opportunities for social interaction; and
- very remote (ARIA score 9.08–12)—very little accessibility of goods, services and opportunities for social interaction.

RRMA was produced in 1994 in conjunction with the Department of Primary Industry and Energy and was based on simple straight-line distances from the mid-point of statistical local areas to a service centre as well as taking into account more subjective criteria.

The geographic concept of remoteness areas, based on ARIA, was included by the ABS for the first time in the 2001 edition of the ASGC after consultation with prospective users.[xxi]

The ABS variant of ARIA allocates geographical areas in terms of their 'remoteness' into: major cities; inner regional; outer regional; remote and very remote.

3.2 Primary health care

It is difficult to access primary health care services if there are no doctors and other health professionals to visit locally: the alternative may be either to travel great distances or to wait for periodic visits by doctors to one's local community. The situation can be summed up as follows

> 'Outside of capital cities, other metropolitan areas and large rural centres, the ratio of primary care practitioners to population is much less than in the urban areas. Remote centres and rural areas outside of large and small centres had fewer than 80 primary care practitioners per 100 000 persons, compared with over 120 in Capital Cities. A much higher discrepancy exists for medical specialists and, in remote areas, for nurses and pharmacists. The higher proportion of Aboriginal and Torres Strait Islander peoples living in more remote areas of Australia leaves them more exposed to difficulties of access to professional services. People living in discrete Indigenous communities have better access to a health centre than a hospital. In 2001, about 57,000 people living in discrete Indigenous communities lived 100 kilometres or more from a hospital but most had a community health centre in the community. There were 174 communities (3,255 people) which were located 100 kilometres or more away from either a hospital or a community health centre. A much higher proportion of households with Indigenous person(s) in remote areas (and to a lesser extent elsewhere) are without vehicles for transport.'[xxii]

The cost of providing health care rises the further the location of such provision is from the major capitals of Australia. There are many well-known reasons for this including:

- diseconomies of small-scale operations;
- greater travel times involved;
- the challenge of attracting and retaining suitably qualified and experienced personnel in remote locations (e.g. having to provide suitable accommodation); and
- the higher cost of communication.

One approach to analysing the added cost of service provision in the bush (as opposed to the city) is to make use of the ARIA category.

Table 3.1 reports the estimated Office for Aboriginal and Torres Strait Islander Health (OATSIH) total and per capita health spending by ARIA category for 1998–99 compiled by the AIHW.[xxiii] It shows generally rising per capita health expenditure as the location of service provision becomes increasingly remote. Fitting a linear trend to the data (see Chart 3.3 in Appendix B) suggests that per capita outlays on the health of Indigenous Australians rises, on average, by approximately $63 per ARIA category (albeit the fit is very far from perfect, with 'underspending' in moderately accessible areas and 'overspending' in remote areas compared with trend line predictions).

Table 3.1: OATSIH expenditure[a], by ARIA category, total and per person for Aboriginal and Torres Strait Islander people, 1998–99

ARIA category	Total ($m)	Total Indigenous—health component ($m)	Per person exp ($)
Highly accessible	47.9	36.9	212.48
Accessible	24.1	18.2	226.82
Moderately accessible	6.4	4.0	97.93
Remote	22.0	17.9	686.96
Very remote	32.3	25.5	296.37
Remote and very remote	*54.2*	*43.2*	*385.57*
Total	**132.6**	**102.4**	**295.02**

(a) Excludes capital expenditures.

Source: AIHW (2001)

To some extent, the trends shown on Chart 3.3 can be rationalised. OATSIH funding is supplemental in nature, and therefore intended to be directed towards satisfying Aboriginal and Torres Strait Islander health needs which mainstream programs such as MBS currently struggle to do. Nevertheless, since mainstream health services are most accessible in metropolitan areas, per capita OATSIH spending on Indigenous health in highly accessible and accessible areas of Australia is often of a referral nature (whereby Aboriginal and Torres Strait Islander peoples are encouraged to present at relevant services by trusted intermediaries). At the other end of the spectrum, providing health services in very remote parts of the continent face the twin problems of being very expensive on the one hand and lacking a critical mass of potential users to justify the investments involved on the other. In between, there has been clearly a significant effort put into providing health services in remote Australia (which can be used by non-Indigenous as well as Indigenous Australians).There are clear challenges to providing suitable services in moderately accessible areas (presumably partly because although some services are available, they are not well tailored to the particular needs of Indigenous Australians), and the high number of such areas also means that what seems to work in one area may not do so in other places similarly classified under the ARIA geographic classification.

Finally, to round off this section, it should be pointed out that the analysis in this section looks at what has been spent, historically, by the Commonwealth on Indigenous-specific health services. Comparisons with the analysis presented in Chapter 2 (on potential health needs) would represent not only juxtaposing potential demand with (a part of)[t] actual supply, but would also beg the question of the best way to respond to the needs. Another way to respond to the health needs of Indigenous Australians is to provide Indigenous-specific services to Indigenous people, which is examined in Chapter 4.

t The other significant supply-side players are the States and Territories, which shoulder primary responsibility for financing many health services throughout their respective jurisdictions (including, in the present case, being primarily responsible for health services in rural and remote Australia).

4 Resource requirement costings model

This chapter is designed to answer Question 2, outlined in Chapter 1. The population benchmark costings model identifies the nature and extent of spending on Indigenous Australians' health based on estimated need on the one hand, and (mainly) Medicare spending to address that need on the other. Such an approach implicitly assumes that the mainstream health system works as well for Indigenous people as it does for the general population. However, Indigenous people have lower rates of use of mainstream health services than the general population despite having poorer health status (e.g. MBS and PBS spending for Indigenous people is only $224 per capita compared to $601 per capita for non-Indigenous people).[xxiv]

One approach used to address the under-utilisation of mainstream health services by Indigenous people is to provide Indigenous-specific health services. Some Indigenous-specific health services currently exist, but these services are not accessible to all Indigenous Australians. The purpose of this chapter is to estimate the cost of providing universal access to Indigenous-specific programs. Only the costs of such an approach are considered in this chapter, we understand the benefits are examined elsewhere in the Review.

The resource requirement costings model presented here, takes as its information base a number of case studies that document the delivery of Indigenous-specific health services. The model then estimates the costs of replicating them on a scale sufficient to provide a primary health care service for all Indigenous Australians. Specifically, this model develops estimates of aggregate costs based on the number and mix of professional health staff (plus other costs) from case studies of primary health care services for Indigenous people in a variety of regional settings.

The cost of an Indigenous-specific primary health care service is calculated on a regional basis. This is because the cost structure of a workable service and its associated staffing mix is different in different (regional) settings (e.g. more doctors per head of target population are required in very remote areas compared to urban settings because of the longer time it takes to travel to treat patients in very remote parts of Australia).

Expert opinion is used to validate the appropriateness of the staffing numbers and mix in the selected case-study services as a basis for costing a health service to cover all Indigenous people. Thus, this chapter includes a sensitivity analysis, that shows the variation in total costs when the staffing mix from the case studies is adjusted to reflect a more appropriate mix. The sensitivity analysis also costs a comprehensive Indigenous-specific health service in rural and urban areas. The health services that are currently operating in these areas are mainly referral services.

The following section describes the methodology and the model results and also presents the results from the sensitivity analysis. A more detailed description of the model results is in Appendix B.

4.1 Methodology

The resource requirement costings model is built around the estimated cost of employing professional health staff to deliver Indigenous-specific health services. The approach assumes that people with the right training, skills and experience are the key to delivering a primary health care service that is appropriate to the needs of Indigenous people. Unsurprisingly, the cost of employing health service staff is the largest component of the cost of providing Indigenous-specific health services. Moreover, health staff costs influence other components of costs (e.g. medical supplies and administrative costs).

The number and mix of health staff required to deliver Indigenous-specific services are obtained from case studies. These case studies document health services provided specifically to Indigenous people. The advantages of using case studies in this resource requirement costing model are:

- the modelling is based on data for Indigenous-specific services currently being delivered; and
- they allow analyses of the cost of resourcing services in remote, rural and urban areas separately.

The model provides a regional analysis of costs because the mix and number of health staff varies according to region (e.g. more doctors are required to service a population of 3000 in a remote area compared to a population of 3000 in an urban area).

There are four steps in modelling the resource requirement costings model (see Figure 4.1):

1. calculating population to health staff ratios based on the case studies;
2. estimating the number of health staff required in each region, as a consequence;
3. estimating total health staff costs thereby implied; and
4. estimating the total costs of an Indigenous-specific primary health care service for Indigenous people.

Figure 4.1: Overview of resource requirement costings model

The first step in the resource requirement costings approach is to estimate population to health staff ratios for each region from the case studies, by category of staff. Data were provided to Econtech by OATSIH on case studies. Three of these case studies were classified as remote services, two as urban and two as rural services.

The number and mix of professional health staff were obtained from the service activity reports (SAR) for each case study. These data record the number of full-time equivalent staff in each health service. The SAR activity reports thus constitute the most important data source in the model because the main driver of costs is the salary cost of professional health staff employees. Section 4.3 examines the appropriateness of using the staffing levels from the case-study services to cost a health service for all Indigenous Australians.

The staffing numbers and the population from services in each region are then aggregated to estimate the population to professional health staff ratio by region. For example, the number of doctors for the three best practice examples in remote areas are added together and divided by the total population across the three services to estimate the workable population to doctor ratio in remote regions.

The second step involves applying the population to health staff ratios to the total population in each region to determine the number of professional health staff required to provide an Indigenous-specific primary health care service to all Indigenous people in that region. For example, say the population in all remote regions was 10 000 people and it was estimated in the first step that one doctor effectively looks after the health needs of 500 people. This circumstance would then imply that 20 doctors would be required to deliver a health service to Indigenous people living in remote areas of Australia.

The third step involves estimating total health staff costs by applying estimated staffing costs to estimated staff numbers. Salary costs vary between regions. Aboriginal health services in remote regions have difficulty in recruiting and retaining health professionals. Consequently, it typically costs more, on average, to staff professional positions in remote areas of Australia than it does in metropolitan areas.

The salary costs applied to the health professional staff in this model are estimates based on salary expenditure from the case studies obtained from their annual financial statements. A salary level for each worker was estimated by weighting the total amount spent on salaries, from each case study, according to the number of each type of worker and using a gradient to reflect relative salary costs for each type of worker. Econtech consulted with managers of Aboriginal health services and of health workforce agencies to ensure that these estimated salary costs reflect the current competitive salary rates. Resulting estimated salary costs are presented in Table 4.1.

Table 4.1: Estimated salary costs ($)

	Very remote & remote ($)	Rural ($)	Urban ($)
Aboriginal Health Worker	36 057	35 593	28 603
General practitioner	171 702	169 491	136 205
Nurse	85 851	84 745	68 102
Specialist medical practitioner	206 042	203 389	163 446
Counsellor	103 021	101 695	81 723
Allied health worker	103 021	101 695	81 723
Dentist	120 191	118 644	95 343
Dental assistant	51 510	50 847	40 861
Traditional healer	30 906	30 508	24 517
Substance misuse workers/environmental health workers	36 057	35 593	28 603

Note: Salary costs include on-costs such as workers compensation and superannuation.

Source: Econtech's calculations based on SARS.

The fourth step adjusts the health staff to estimate the total cost of providing primary health care services. Other costs include those for employing non-professional health staff (e.g. executive officers, administrative workers and drivers) and overhead or general operating costs.

The adjustment factor for non-professional health staff is estimated residually by subtracting the salary costs of the health professionals estimated in Step 3 from the total expenditure on salaries in each health service. Expenditure data were obtained from annual financial statements from each health service.

To estimate the loading cost factor for general operating costs we assume that general expenses are a fixed proportion of total expenses. Commercial bodies estimate general operating expenses by estimating general expenses as a proportion of total income. In this model income and expenditure are the same. So essentially we have used the same approach as commercial entities in estimating general operating costs.

4.2 Case study services

The population distribution for Indigenous people is different to that of the general population. For example, 81% of the total population live in highly accessible areas. This compares to 46% of the Indigenous population living in highly accessible areas. At the other end of the distribution, only 1% of the total population live in very remote regions. The corresponding figure for the Indigenous population is 15.3% (Table 4.2).

Table 4.2: Population distribution by ARIA, 2001

ARIA* category	Total population		Indigenous population	
	No.	%	No.	%
Highly accessible	15.06m	83.3	211 094	46.1
Accessible	1.97m	10.5	89 667	19.6
Moderately accessible	0.07m	3.7	44 932	9.8
Remote	0.02m	1.4	42 267	9.2
Very remote	0.09m	1.0	70 324	15.3
N/A	0.09m	0.1	-	-
Total	18.8m	100.0	458 284	100.0

Source: ABS – ERP by Indigenous status by SLA, 2001 ASGC, 30 June 2001 (final 2001 Census rebased data) released 3 April 2003

*Mapping of SLAs to ARIA category undertaken by Department of Health and Ageing

The ARIA classification measures accessibility to services in general, and not necessarily to health services in particular. For example, the ARIA classification indicates that the Very Remote Case Study 1 is a remote region but when its catchment area is taken into account it is more properly regarded as a very remote service. This means that a distinction can be made between where a service is based and where services are actually delivered (Table 4.3).

Table 4.3 Characteristics of case study services

Health service	ARIA classification	Regional classification of service
Very remote		
Very Remote Case Study 1	Remote	Very remote
Very Remote Case Study 2	-	Very remote
Remote		
Remote Case Study 1	Remote	Remote
Rural		
Rural Case Study 1	Accessible	Accessible
Rural Case Study 2	Accessible	Accessible
Urban		
Urban Case Study 1	Highly accessible	Highly accessible
Urban Case Study 2	Highly accessible	Highly accessible
Urban Case Study 3	Highly accessible	Highly accessible

Case study services, based on the regional classification of the entire service, were selected to reflect the population distribution of the Indigenous population. Specifically, two very remote area services and one remote service served as the basis of generalisation for very remote and remote areas respectively. For the urban analysis, three services in highly accessible areas formed the inferential basis. For the rural analysis two accessible health services were chosen. Selected services are described in Table 4.3. One on-site familiarisation visit was made by a representative from Econtech to an urban service.

The following qualifications apply to use of these case studies to represent the cost of an Indigenous-specific health service for all Indigenous Australians:

- the rural case studies are town-based and may not 'fit' all rural areas and hence the costs in rural areas are indicative costs only; and
- the total costs are based on only a small number of case studies in each region and do not pick up the heterogeneous nature of a health service for Indigenous people.

In order to be able to cost a health service for all Indigenous Australians, we need to ensure that the case-study services in each region are comparable and that the analysis uses costs for well used services in each region. These two issues can be addressed by estimating for each service utilisation rates that measure the number of episodes of care per staff member and can be broken down as follows:

Episodes of care/staff = Pop/no.of staff x Episodes of care/pop

where the population to staff ratio measures the supply of health workers to a service and the number of episodes of care per population measures the met demand.

Table 4.4 shows the utilisation rates and its components for the case-study services in remote areas. The equivalent tables for the other regions are shown in Tables B1, B2 and B3 in Appendix B.

Case-study health services in very remote areas are comparable in terms of utilisation rates (Table 4.4). The services are also relatively busy with each staff member delivering around 500 episodes of care per year. The supply of staff is greater in the Very Remote Case Study 2 Health Service because the demand for health care is greater.

Not surprisingly, health services are less busy in remote areas than health services located in rural and urban areas because health professionals cannot treat as many patients due to longer travelling times in remote areas.

Table 4.4 Utilisation rates for health services in very remote regions

	Case Study 1	Case Study 2
Episodes of care per staff member	545	584
Pop/no. of staff	54	31
Episodes/pop	10	19

Source: Service Activity Reporting 2000–01 and information provided by individual services

In summary, the location of the best practice health services used in the model roughly matches the location of the population of Indigenous people in Australia. In addition, the services that are included in the costings model are comparable in each region and are well used services.

4.3 Model results

This section presents model results by region. These results are based on the current level and mix of health staff professionals in each case study and serve as a starting point to estimate the total cost of a health service for Indigenous people. Section 4.4 adjusts the total costs estimated from this model to take into account other factors.

The first step in this analysis is to estimate population to staff ratios in each region based on these staffing arrangements and the total population in the area where each service is located. Each category of health worker and the population for case-study services in each region are combined to derive a population to staff ratio for each health professional by region. For example, the numbers of doctors from the two case studies in a very remote area were aggregated and divided by the total population from the two services to estimate the number of people one doctor can effectively treat in a year in a very remote area.

As shown in Table 4.5 more health staff per population are required to deliver an Indigenous-specific service in remote Australia compared to rural and urban areas. For example, around 1 doctor per 690 people is required to deliver an Indigenous-specific service in very remote areas. The corresponding figure for remote, rural and urban areas is 689, 1681 and 2532 respectively.

The estimated ratios for GPs, nurses and Aboriginal Health Workers in remote and very remote areas are broadly comparable to recommended ratios described in previous studies. For example, Barlett et al[xxv] estimated that standard ratios of Aboriginal Health Workers, GPs and nurses to the population in the Northern Territory are 1:250, 1:1000 and 1:500 respectively. The estimated ratios for the other types of health staff are significantly different to the recommended ratios. For example, the recommended ratios for counsellors, dentists and allied health workers[xxvi] are 1:400, 1:1800 and 1:1200, which are considerably different to the estimated ratios in Table 4.5 for all regions.

Previous studies in this area concentrate on standard staff to population ratios for remote regions. Thus, there is no suitable point of comparison for the rural and urban ratios.

In summary, this study underestimates the health staff to population ratios for some types of health workers. This indicates that there are limitations in using case studies to estimate the total resources required for Indigenous-specific health services because the case studies may not address all key health needs. This is because some of the case studies target specific subgroups of the Indigenous population. For example, some of the health services place a strong emphasis on the health needs of expectant mothers.

Table 4.5 Population to staff ratios for each region[(a)]

	Very remote	Remote	Rural[(b)]	Urban
Aboriginal Health Worker	121	443	1 187	715
General practitioner	692	689	1 681	2 532
Nurse	151	1 551	2 242	2 532
Specialist medical practitioner	4 842	6 205	20 176	6 582
Counsellor	-	1 551	2 242	4 702
Allied health worker	4 842	2 068	-	10 971
Dentist	4 842	6 205	10 088	5 485
Dental assistant	4 842	6 205	3 363	3 657
Traditional healer	2 421	-	-	-
Substance misuse workers/environmental health workers	2 421	-	10 088	10 971
Population from best practice services	4 842	6 205	20 176	32 912

Notes:

(a) Includes visiting health professional staff

(b) The high population to staff ratio for Aboriginal Health Workers in rural areas is based on a low proportion of Aboriginal Health Workers in one of the rural case study services. Only 7% of the total staff are Aboriginal Health Workers in that service. This compares to over 25% in other health services.

Source: Econtech

The next step in the model is to estimate the total number of health professional staff needed in remote areas using the population to staff ratios in Table 4.6 and the total Indigenous population in these regions. As shown in Table 4.6, more professional health staff are required in very remote regions than remote, rural and urban areas. This is because of the higher number of professional health staff required to service the Indigenous population in very remote areas and the high numbers of Indigenous people in this area.

Table 4.6: Staff numbers

	Very remote	Remote	Rural	Urban
Aboriginal Health Worker	581	95	113	295
General practitioner	102	61	80	83
Nurse	465	27	60	83
Specialist medical practitioner	0	0	0	32
Counsellor	0	27	60	45
Allied health worker	15	20	0	19
Dentist	15	7	13	38
Dental assistant	15	7	40	58
Traditional healer	29	0	0	0
Substance misuse workers/environmental health workers	29	0	13	19
Total regional population	**70 324**	**42 267**	**134 599**	**211 094**

Source: Econtech

To estimate the total cost of professional health staff, relevant salary costs are applied to each category of health worker by region. The salary costs applied to each category of health worker are estimated costs and are those reported in Section 4.1.

The total salary costs for each type of professional health worker are aggregated and two loading factors are applied to arrive at a total estimate of the cost of an Indigenous-specific health care service in Australia. The loading factors take into account the salary costs of non-professional staff and general operating costs. The total cost is estimated at $409 million. This translates into a per capita cost of $893.

These costs are significantly higher than what is currently being spent by OATSIH on health services for Indigenous Australians ($295 per capita[xxvii]), but are less than that estimated by the population benchmark model ($2500).

The costs estimated by the resource requirement model increase with the degree of remoteness. For example, the cost per Indigenous person in very remote areas is over six times the cost per capita in urban areas. This is because primary health care services in very remote areas have to deliver a more complete service than that in urban areas—as well as those services being comparatively more expensive. Indigenous-specific health services provided in urban areas are often of a referral nature. A more complete service in all areas will increase the costs significantly (see Table 4.7 and Section 4.4).

Table 4.7: Costs of a universal Indigenous-specific primary health care system

	Very remote	Remote	Rural	Urban	Overall
Full service in remote areas and partial service in rural and urban areas:					
Total cost of professional health staff ($m)	87	24	34	43	188
Total staff costs ($m)	129	35	46	58	268
Total costs ($m)	196	53	76	84	409
Costs per capita ($)	2 789	1 266	561	399	893
Full service in all areas [(a)]:					
Total costs ($m)	196	53	151	169	570
Cost per capita ($)	2 789	1 266	1 125	800	1 244

Note:

(a) Estimates for full service in remote areas and partial service in rural and urban areas are based on case studies. No case studies are available for a complete service in rural and urban areas, so estimates of full service in all areas are only indicative of the possible cost of a complete service in urban and rural areas.

Source: Econtech

Estimated costs in the above analysis would represent only a part of overall resource requirements needed to address Indigenous health more widely, since the costings take no account of mainstream programs and providers used by Indigenous Australians in each area (particularly in urban areas). It was not possible to explicitly model the costs of the health service provided by mainstream programs and providers to Indigenous Australians in this report due to the short time frame (indicative figures are provided in the next section). However, Econtech's costings model can be extended to include such analysis in the future.

4.4 Sensitivity analysis

The estimated costs reported in Chapter 4 are based on the assumption that the case study services employ the appropriate level and mix of professional health staff to deliver an Indigenous-specific health care service to the Indigenous population in their catchment areas. Estimated costs are also based on the fact that Indigenous-specific health services in urban areas provide a less complete health service compared to that in remote and rural areas. This is due to the referral nature of some of the health services in urban areas.

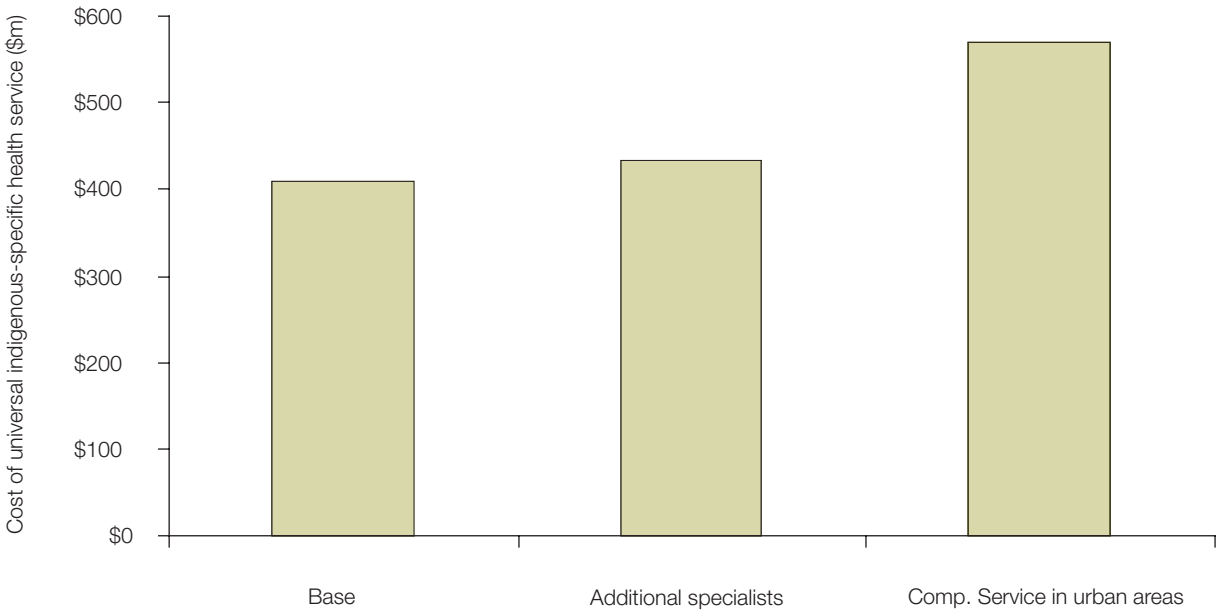
The purpose of this section is to calculate the variation in total costs if more specialists are employed in Indigenous-specific health services in very remote, remote and rural areas and also if a more complete primary health care service is provided in rural and urban areas. This section outlines the main results. Details are included in Appendix B.

Expert opinion was sought on the appropriate level and mix of health professionals included in the case studies in each area. The general consensus was that not enough specialists were operating in very remote, remote and rural areas to deliver an appropriate service. The appropriate number of specialists were (re-)estimated, based on expert opinion, for each case study and used to estimate an augmented number of specialists for each region. Figure 4.2 shows that this results in total costs increasing from $409 million (base) to $432 million—translating into an increase from $890 to $944 on a per capita basis (see Table B4).

The other sensitivity test involved costing a comprehensive primary health care service for Indigenous people in rural and urban areas rather than a partial service in rural areas and a referral-type service in urban areas. Case studies are not available for a complete service in rural and urban areas. This means that this report is only able to provide very broad estimates of the costs of a complete service in rural and urban

areas. Figure 4.2 and Table 4.7 show that a comprehensive primary health care service in urban areas causes the costs to increase significantly, from $409 million to $570 million—equivalent to a rise from $893 to $1244 on a per capita basis. The increase in cost is considerable because large numbers of Indigenous people live in Australian cities.

Figure 4.2: Sensitivity analysis



5 Policy context

It is important to understand the policy context of this study, especially as it has evolved in recent years.

In 2001 the CGC *Report on Indigenous Funding*[xxviii] was released. The main findings from this report in relation to Indigenous health funding were as follows.

- The health outcomes for Indigenous Australians are much poorer than for other Australians. The health status of Indigenous people in remote areas is poorer than that of Indigenous people in urban and rural areas. It is critical for the Commonwealth to increase Indigenous Australians' access to Medicare and the PBS.
- Over the past decade the Commonwealth has increased expenditure on primary health care and is continuing to expand programs in this area through both additional funds and increasing access to Medicare and PBS. However, a further significant increase in these funds would be necessary to bring direct Commonwealth expenditure on Indigenous people to the Australian average.
- There is no evidence that any state/territory, region or location has resources excessive to those required to address the health need of Indigenous people.
- Overall funding for Indigenous Australians' health, while slightly above the average spent on all Australians, is significantly below what would be expected for a group with such a poor health status.
- Total resources for Indigenous health are greater in urban areas than in rural or remote regions. This is similar to health financing for all Australians but does not match the patterns of needs for Indigenous health funding.
- A range of conceptual and practical difficulties must be addressed if reliable measures of relative health need are to be developed. These include identifying funds and obtaining reliable data.
- It is also necessary to overcome physical and cultural barriers to access to services. To achieve better access to primary health care services and to enhance the effectiveness of these services requires genuine partnerships with Indigenous people, improved delivery of mainstream health services and expansion of community-controlled health services, with a stronger focus on environmental health issues.

In 2002 the Federal Government responded to the CGC report[xxix]. Salient points made by the Government in responding to the health section of the CGC report included the following.

- There was an acknowledgment that mainstream services have not performed as well as they should in meeting the needs of Indigenous people, and that this failure has placed undue pressure and expectations on the limited funds available for Indigenous-specific services.
- There was agreement with the CGC's assessment of the circumstances of Indigenous Australians. In all areas, Indigenous people typically experience entrenched levels of disadvantage compared with non-Indigenous people. Disadvantage is high in all areas, but is greater in remote areas. The social, economic and cultural circumstances of Indigenous Australians differ greatly between urban, rural and remote locations, and between and within Aboriginal and Torres Strait Islander Commission (ATSIC) regions, and these differences have an impact on need and service provision. Location also affects the range of services provided to Indigenous people, the way in which services are provided and the costs of providing services.
- There was also agreement with the CGC that needs should be defined ultimately in terms of outcomes, or indicators of the relative status of Indigenous people compared with non-Indigenous people. Improved outcomes are and will continue to be the goal; process indicators such as access to services can be useful

interim indicators in terms of forecasting outcomes. However, care needs to be taken in using access to services as a surrogate for reducing Indigenous disadvantage, with the Government's focus being on further developing its capacity to measure need in terms of outcomes rather than only looking at the relative availability of services.

- There was agreement with the CGC that, in targeting resources to achieve identified outcomes, judgements need to be made about which aspects of those outcomes are more important and relevant to Indigenous people.
- The Government observed that the illustrative indicators developed by the CGC consistently point to the highest needs per person or per household being in the remote ATSIC regions, as almost 80% of the most socioeconomically disadvantaged Indigenous people live in very remote Australia. At the same time, most Indigenous people live in accessible areas and so there are some urban localities with significant numbers of highly disadvantaged people (e.g. Redfern in NSW and Swan in Western Australia).

Appendix A: Detailed results: population benchmark model

Chart 2.1: NHPA morbidity patterns, general population

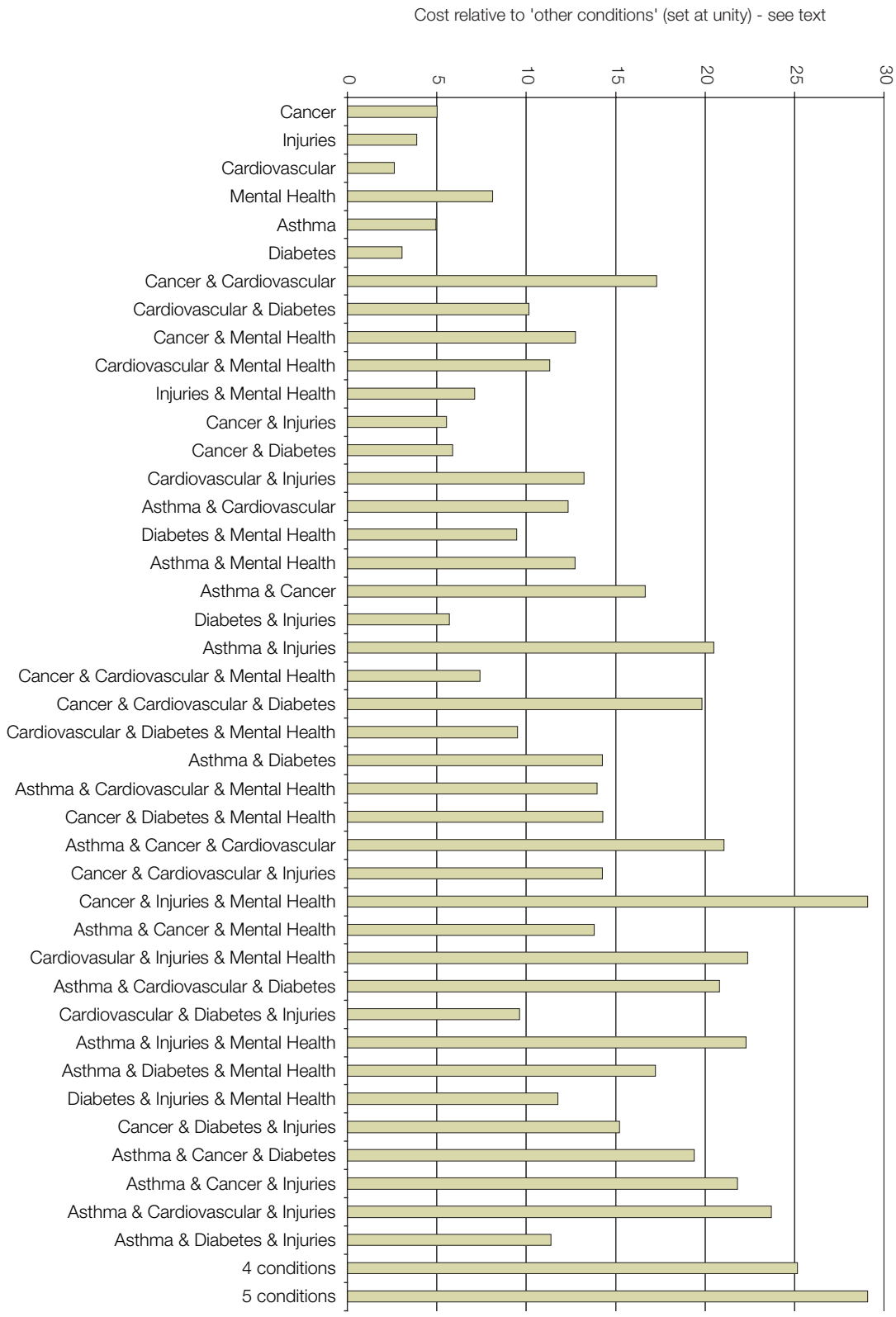
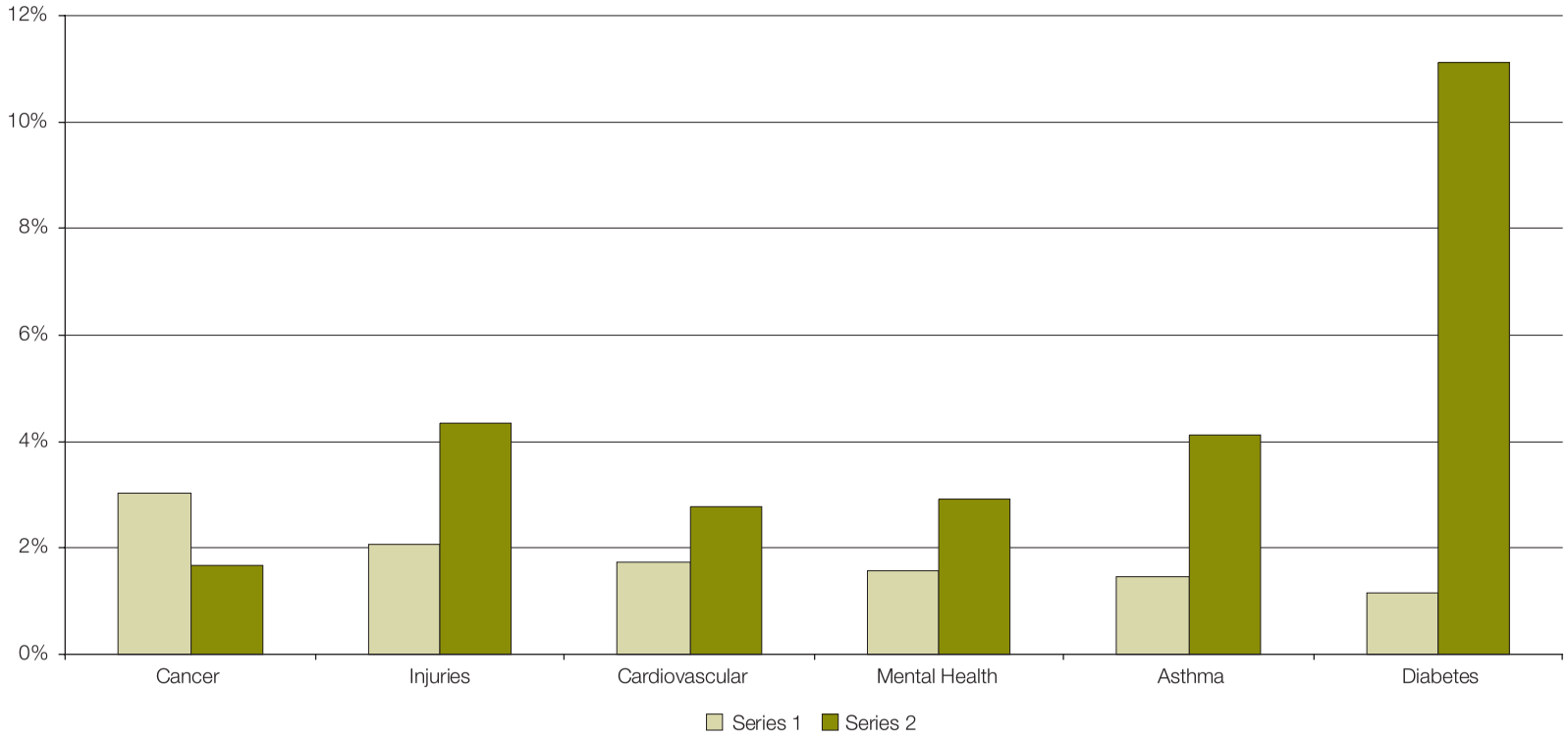


Chart 2.2: NHPA morbidity patterns, relative costs

Chart 2.3: Estimated NHPA morbidity patterns for non-Indigenous (series 1) and Indigenous Australians (series 2)



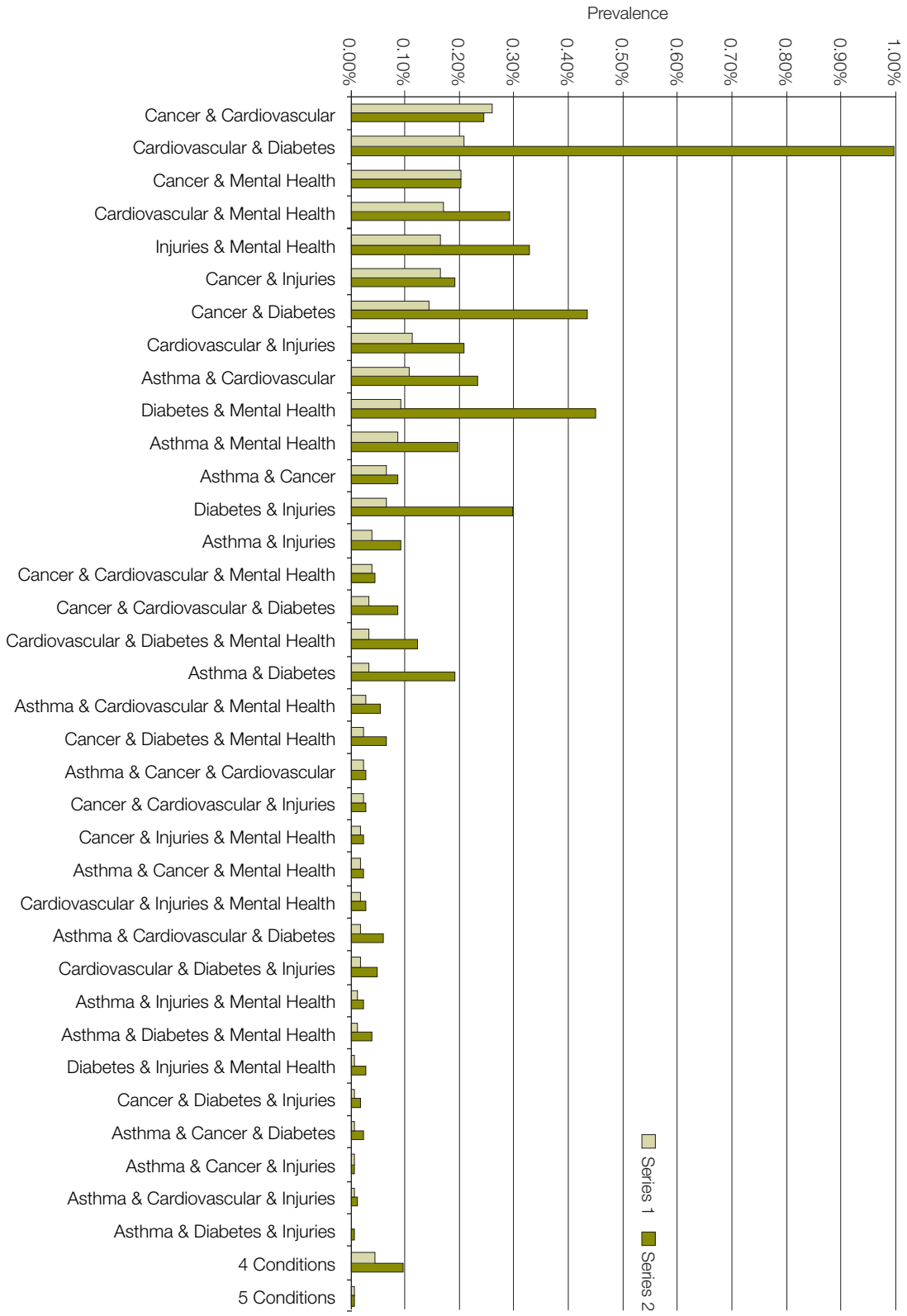


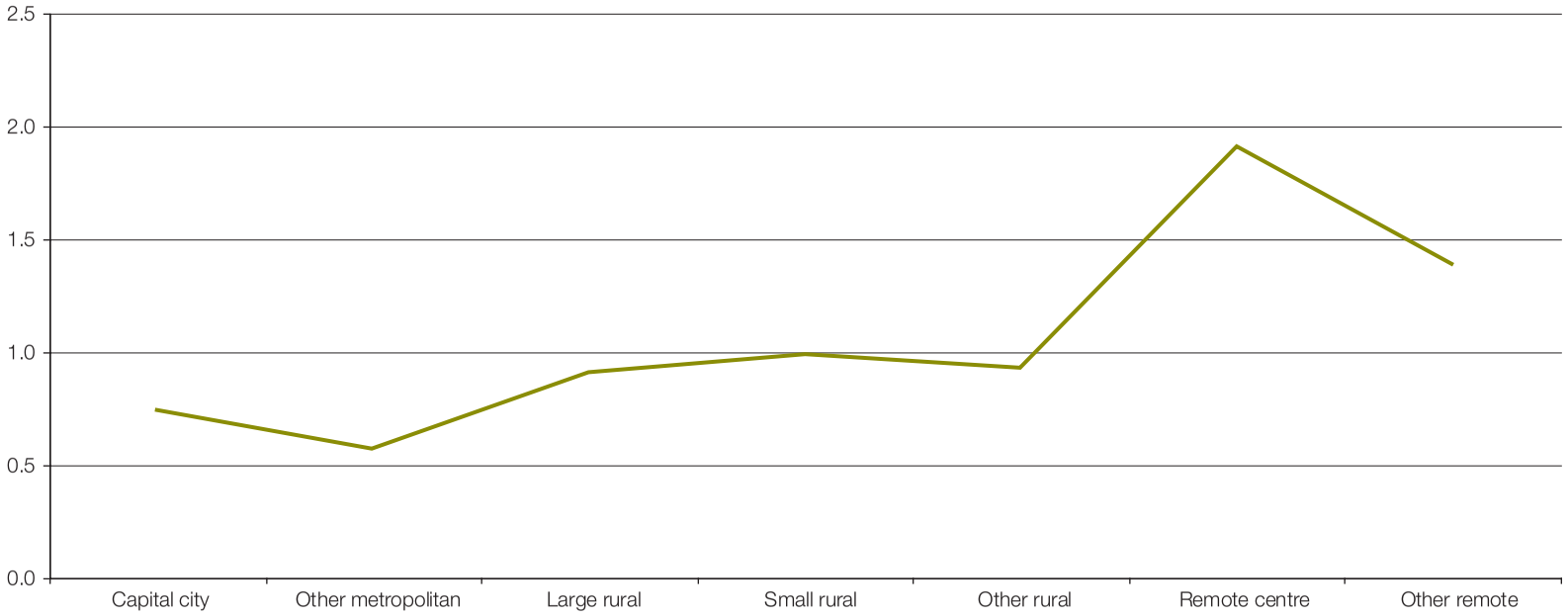
Chart 2.4: Estimated NHPA comorbidity patterns for non-Indigenous (series 1) and Indigenous Australians (series 2)

Appendix B: Detailed results: resource requirement model

Chart 3.1: Relation between (age-standardised) Indigenous death rates and accessibility to services

Source: Commonwealth Grants Commission (2001)

Chart 3.2: Relation between Indigenous sickness rates and accessibility to services



Source: Commonwealth Grants Commission (2001)

Chart 3.3: Per person OATSIH expenditure by ARIA category ($)

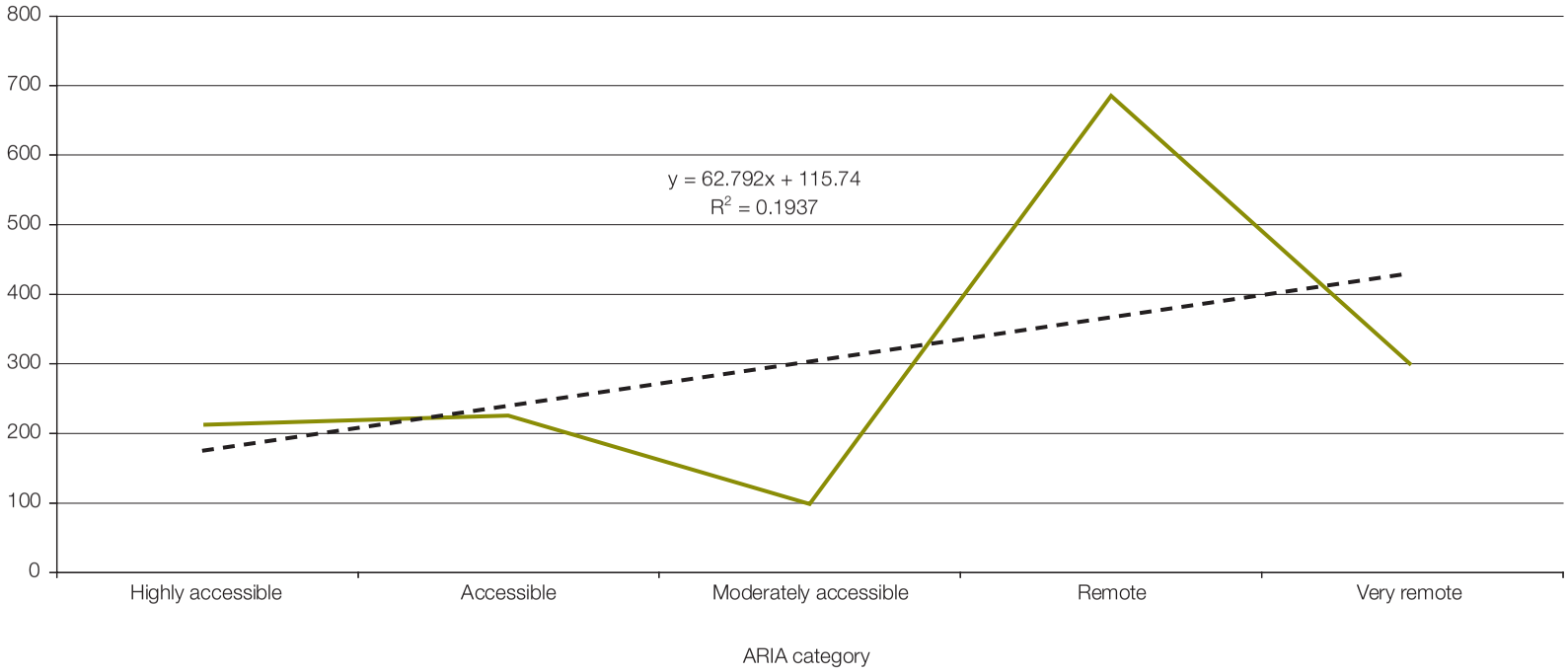


Table B1: Utilisation rates from best practice health service in remote areas

	Remote case study
Episodes of care per staff member	412
Pop/no. of staff	77
Episodes/pop	5

Table B2: Utilisation rates from best practice health service in rural areas

	Rural case study 1	Rural case study 2
Episodes of care per staff member	630	706
Pop/no. of staff	186	229
Episodes/pop	3	3

Table B3: Utilisation rates from best practice health service in urban areas

	Urban case study 1	Urbane case study 2	Urban case study 3
Episodes of care per staff member	1176	435	344
Pop/no. of staff	285	172	196
Episodes/pop	4	3	2

Table B4: Detailed costs as result of employing more specialists

	Very remote	Remote	Urban	Rural	Total costs
Number of additional specialists	29	24	0	60	113
Average salary for specialists ($)	206 042	206 042	163 446	203 389	
Incremental costs of employing specialists ($)	5 985 010	4 912 267	0	12 211 726	23 109 002
Total costs ($)	202 140 126	58 406 846	84 240 200	87 728 202	432 515 374
Costs per capita ($)	2 874	1 382	399	652	944

Endnotes

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[vi] Australian Bureau of Statistics (2002a). *Housing and infrastructure in Aboriginal and Torres Strait Islander communities, Australia (2002)*. Cat. no. 4710.0, Canberra.

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[xvi] AIHW 2001, p.3.

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[xxiii] Table 7.11 of AIHW 2001

[xxiv] AIHW 2001.

[xxv] Bartlett B and Duncan P (2000), '*Top End Aboriginal Health Plan*', Report to the Top End Regional Indigenous Health Planning Committee of the Northern Territory Aboriginal Health Forum.

[xxvi] Standing Committee on Aboriginal and Torres Strait Islander Health, Aboriginal and Torres Strait Islander Health Workforce National Strategic Framework: Consultation Draft, AHMAC, Canberra, 2001.

[xxvii] AIHW 2001.

[xxviii] CGC 2001, p. xxi.

[xxix] Commonwealth of Australia (2002). *Government Response to the Commonwealth Grants Commission Report on Indigenous Funding 2001*, Commonwealth of Australia, Canberra.